Response to WPTF's July 26, 2017 Letter to the ISO Board

Department of Market Monitoring
September 12, 2017

I. Summary

The Western Power Trading Forum (WPTF) submitted a letter to the ISO board on July 26, 2017.[1] The letter refers to data and charts provided by the ISO at the most recent Market Planning and Performance Forum.[2] WPTF's letter contends that "Early ISO Analysis Reveals No Systematic CRR Biases or Distortions," and makes numerous other statements that are not supported by the data and lead to what DMM believes is a significant misrepresentation of the performance of the ISO's congestion revenue rights (CRR) auction. This paper provides DMM's response to the assertions and implications incorporated in WPTF's letter, along with further analysis highlighting the fundamental problems underlying the ISO's current CRR auction design. The memo also provides additional information on CRR market results in other ISOs which indicate these problems are occurring in most other CRR markets as well.

II. Ratepayers systematically lose money in the auction

WPTF states that the "Early ISO Analysis Reveals No Systematic CRR Biases or Distortions". However, the ISO data shows that CRR payments have consistently been higher than auction revenues. As shown in Figure 1, ratepayers have consistently lost money in the CRR auction. This clearly reflects a *systematic bias* and *distortion* in the CRR auction.

The trend of transmission ratepayer losses over the last five years continued in the first half of 2017. Through the second quarter of 2017 transmission ratepayers lost about $29 million in the CRR auction, receiving just $0.61 per dollar paid out to non-LSE auction participants. Financial entities on net received about $25.5 million in profits from the CRR auction, paying $0.46 per dollar received. Marketers and Physical generators on net received $2.0 million and $1.6 million in profits, paying $0.91 and $0.69 per dollar received. The first half of 2017 is comparable to the first half of 2016. In the first half of 2016 transmission ratepayers lost about $27 million, receiving $0.63 per dollar paid out.

[1] Western Power Trading Forum letter to ISO Board, July 26, 2017: http://www.caiso.com/Documents/PublicComment-Letter_WPTF_CRRs-Jul26_2017.pdf

[2] Presentation for the Market Planning and Performance Forum July 18, 2017: http://www.caiso.com/Documents/Agenda-Presentation_MarketPerformance-PlanningForum-Jul18_2017.pdf.

Figure 1. CRR auction revenues received and payments to auctioned CRRs by transmission ratepayers

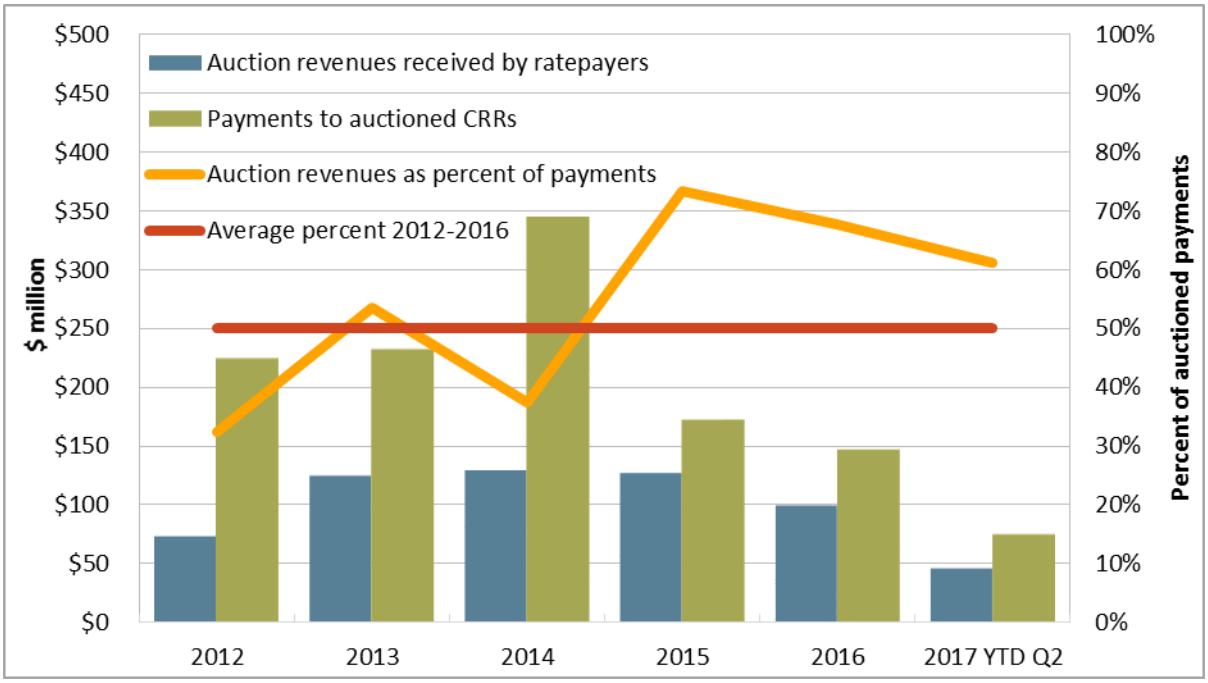
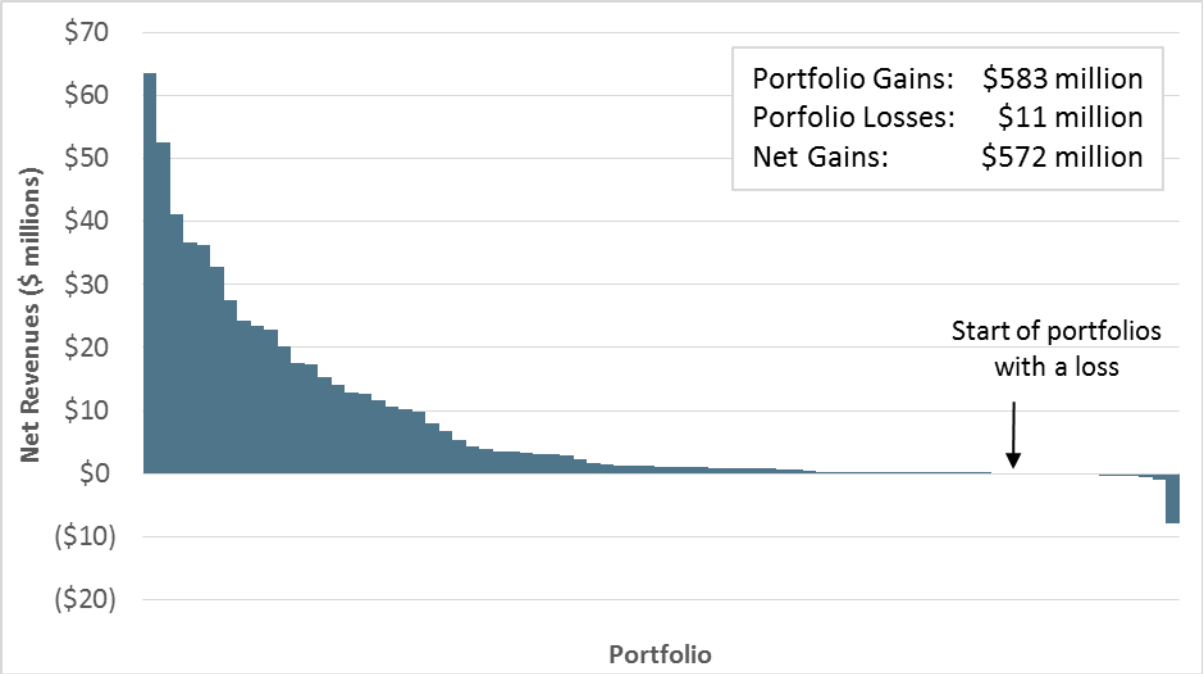


Figure 2 shows the distribution of total profits and losses for all portfolios of CRRs purchased by non-LSEs over the 2012 through 2016 period.[3] These data illustrate that profits from the portfolios of CRRs purchased by different non-LSEs in the auction were extremely skewed.

Non-LSE portfolios that were profitable were paid about $583 million dollars. Non-LSE portfolios that were not profitable lost only about $11 million. The losses were less than 2% the amount of gains. This is not indicative of a well-functioning market. The $572 million difference was paid by transmission ratepayers.

[3] Figure 8 in Section VI is a similar chart showing portfolio profits by quarter.

Figure 2. Total non-LSE auctioned CRR portfolio gains and losses (2012-2016)



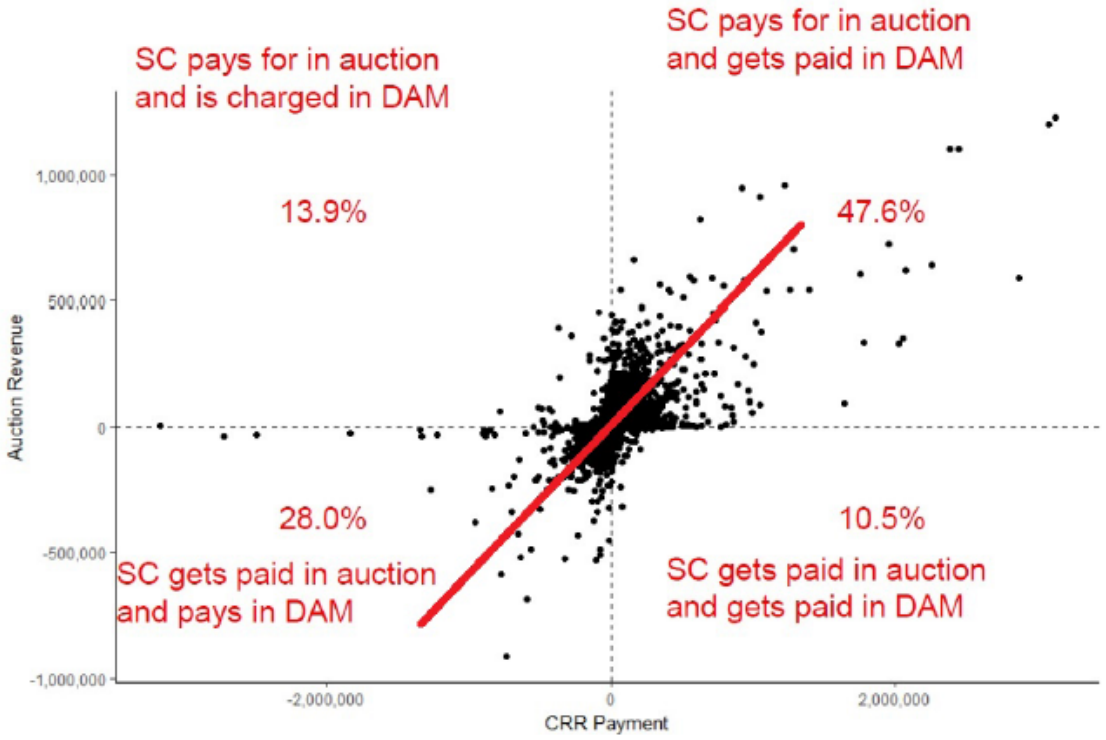
III. WPTF's use of ISO's scatter chart

In its letter to the Board, WPTF included a scatter chart of CRR portfolio payments and auction costs that was presented by the ISO in a recent stakeholder meeting. The ISO's chart – and the way it was modified by WPTF — seems to tell a very different story about the distribution of profits and losses for auctioned CRR portfolios than DMM's analysis. As explained below, WPTF's adaption and use of the scatter chart created by the ISO is very misleading as an indicator of the distribution of auctioned CRR portfolio profits and losses – and WPTF's claims are not supported by this chart.

Figure 3 shows the scatter chart from WPTF's letter. The horizontal axis (*CRR Payment*) represents the payments a CRR portfolio received in the day-ahead market. The vertical axis (*Auction Revenue*) represents how much a CRR portfolio paid for its CRRs in the auction. A portfolio gained money if the CRR Payments received (on the horizontal axis) were greater than the Auction Revenues paid out by an entity (on the vertical axis).

Figure 3. Chart from WPTF Letter to the Board

Monthly CRR portfolio auction revenues versus payments received (2014-2016)



WPTF's chart includes a misleading 45 degree line that was added to the ISO chart. WPTF added a 45 degree line to the ISO's chart that makes it appear that the data on CRR profits and losses are somewhat balanced and symmetrical. If the axis of this chart used the same scale, any point below the 45 degree line would represent a profitable CRR portfolio, while each point above the line would represent an unprofitable portfolio. However, this is misleading since the ISO's chart does not use the same scale for each axis. Each $1 million of auction revenue on the vertical axis is represented by roughly the same length as $2 million of CRR payments on the horizontal axis. WPTF's 45 degree line is a misleading reference line and hides the true skewness of the data.

The scatter chart provided by the ISO and WPTF includes load serving entity portfolios. The scatter chart provided by the ISO that was included in WPTF's letter also includes the CRR portfolios of load serving entities. This obscures the final impact that the auction has on transmission ratepayers. If a non-load serving entity loses money from a CRR auction portfolio, those losses are ultimately realized as a profit by transmission ratepayers. However, if a load serving entity loses money on its CRR auction portfolio, those losses are incurred by transmission ratepayers and offset the gains that transmission ratepayers receive from that one load serving entity's losses. Non-load serving entity CRR auction gains or losses provide the

relevant information for assessing the extent to which transmission ratepayers are losing money from the CRR auction.

Calculating the profitability of seasonal CRRs on a monthly basis makes CRR portfolio gains and losses appear to have more variation. The ISO's chart shows monthly data. Using monthly data for quarterly products can make the data appear to have more variation than exists.[4] In practice, entities create portfolios of both monthly and quarterly CRRs. Aggregating portfolios quarterly avoids arbitrarily assigning quarterly costs to individual months.

IV. Revised scatter charts

To provide an accurate indication of the distribution of profitable and unprofitable CRR portfolios, DMM created a series of scatter charts that correct for the issues described above. The charts have consistent scales for each axis. Therefore, the 45 degree line in each chart is a meaningful reference. Observations below the 45 degree line are quarterly CRR portfolios that were profitable. Observations above the 45 degree line are quarterly portfolios that were unprofitable.[5]

Figure 4 includes the CRR portfolios of load serving entities, but it highlights LSE portfolios in orange so that their profits or losses can be distinguished from the profits or losses of non-LSEs. Figure 5 shows this same chart, but with the load serving entity CRR portfolios removed.

Figure 6 shows the same scatter chart, but with only the CRR portfolios from financial entities. The axes in Figure 6 are truncated at $10 million to more easily see the bulk of the data.[6] Additional charts that illustrate the distribution of CRR auction portfolio gains and losses are included in Section VI at the end of this report.

[4] For example, assume a financial trader bought a CRR in the annual auction with a quarterly term of April through June. The trader paid $9 for the CRR, for which they received payments of $12, gaining $3. The monthly chart would look at the payments in each month, say $2 in April, $2 in May, and $8 in June. The chart would then assign $3 of cost to each month. The monthly scatter chart would make it appear that the trader lost $1 in April, lost $1 in May, and gained $5 in June. But the arbitrary equal assignment of CRR cost to each month drives these apparent variations in gains and losses. In reality, the trader paid $9 for a quarterly CRR and received $12 over the term of the CRR contract.

[5] These charts also show CRR portfolio data from Q1 2014 through Q2 2017 calculated on a quarterly basis corresponding to the term of seasonal CRRs (rather than on a monthly basis).

[6] The full data set can be seen in Figure 5.

Figure 4. Quarterly auction revenues versus payments to CRRs by portfolio (2014 to Q2 2017)

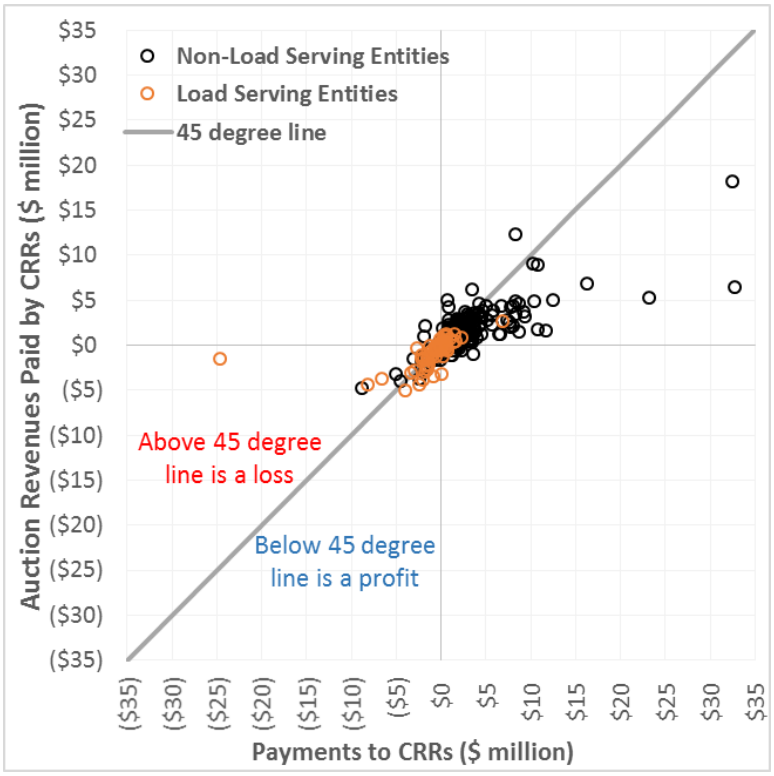


Figure 5. Quarterly auction revenues versus payments to CRRs by portfolio (2014 to Q2 2017)

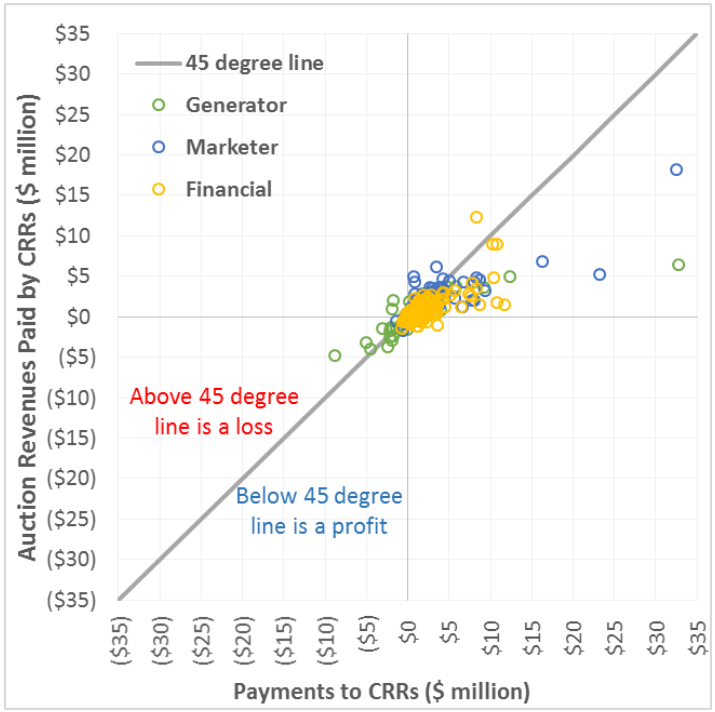
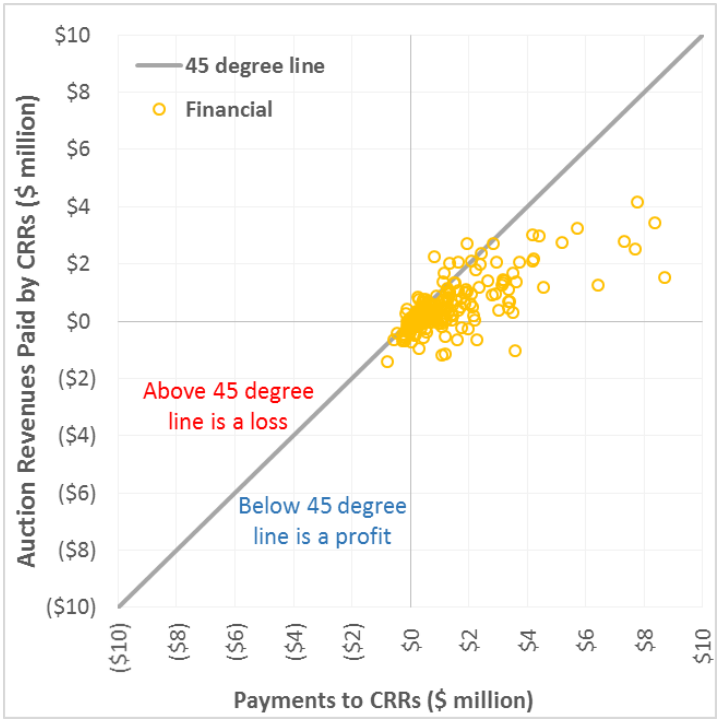


Figure 6. Financial entities quarterly auction revenues versus CRR payments by portfolio (2014 to Q2 2017)



WPTF's claim about use of CRRs for hedging is inaccurate and indicates a misunderstanding of the data. WPTF claims the chart shows that "over 75% of the time, participants pay for a valuable hedge or sell back an allocated position." Nothing in the scatter chart supports this claim. WPTF appears to have arrived at this 75 percent figure by erroneously adding two percentages (47.6 percent + 28.0 percent) that are displayed on the ISO scatter chart (Figure 3) discussed above.

The first component of the 75% claim is the upper right quadrant of portfolios that on net paid in the auction and on net received positive CRR payments at day-ahead prices (which is labeled as including 47.6% of the monthly portfolios displayed in the ISO's chart). WPTF's claim implies that a CRR portfolio represents a "hedge" if the net payment from that portfolio into the auction was positive and that net payments to that portfolio from the day-ahead market were positive. Such a conclusion is clearly unfounded. The scatter chart has no information about outside positions and cannot say which CRR portfolios are hedging forward energy contract basis risk and which are not.

The second component of the 75% claim is the lower left quadrant of portfolios that on net get paid in the auction and on net were charged for CRRs at day-ahead prices (which is labeled as including 28% of the monthly portfolios displayed in the ISO's chart). WPTF's claim implies that a portfolio is "selling back an allocated position" if the portfolio on net got paid in the auction

and was charged for its CRRs in the day-ahead market. Again, the chart simply does not have information about other positions including allocated CRRs, so that such a conclusion is erroneous.

WPTF also states that the "other 25% of the times reflect imperfect information". It is not clear what WPTF means by "imperfect information," but their statement indicates that WPTF does not understand the data in the chart.[7]

V. Ratepayers CRR/FTR auction losses occur in other ISOs/RTOs

The California ISO is not the only ISO/RTO where transmission ratepayers have been losing money in FTR (CRR) auctions.[8] Finding comparable data across ISOs/RTOs is difficult. However, there are clear indications FTR auctions are highly profitable for the auction participants in multiple markets.

PJM. In the PJM Interconnection transmission ratepayers have lost over a billion dollars in FTR auctions from 2011 to 2016. Financial entities have received about $230 million per year in FTR profits.[9]

MISO. In the Midcontinent ISO only 81% of the 2016-2017 planning year day-ahead market congestion rent was received by transmission ratepayers.[10] As explained in earlier DMM reports, this implies that transmission ratepayer losses in the FTR auction were equal to about 19% of day-ahead congestion rents for the period.[11] Day-ahead congestion rent was $751

[7] A CRR portfolio in one of these "imperfect information" quadrants can consist only of individual CRRs in the two normal quadrants. Consider a simple portfolio consisting of two CRRs. The first CRR pays $1 in the auction and is paid $2 in the day-ahead market. The second CRR is paid $2 in the auction and is charged $1 in the day-ahead market. Neither of the CRRs individually would be in a quadrant that WTPF considers "imperfect information". Combining the two CRRs creates a portfolio that on net receives $1 in the auction and on net is paid $1 in the day-ahead, so WPTF would consider the portfolio as reflecting "imperfect information."

[8] CRRs in other ISOs/RTOs are also known as financial transmission rights (FTRs), transmission congestion contracts (TCCs), and transmission congestion rights (TCRs).

[9] Monitoring Analytics, *State of the Market Report for PJM* p. 553: http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2016/2016-som-pjm-sec13.pdf

[10] Midcontinent ISO *ARR/FTR Transmission Customer Metric May 11, 2017*: https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/MSC/2017/20170511/20170511%20MSC%20Item%20XX%20ARR%20FTR%20Transmission%20Customer%20Metric%20April%202017%20Update.pdf

[11] Department of Market Monitoring *Shortcomings in the Congestion Revenue Right Auction Design* p.6: https://www.caiso.com/Documents/DMM-WhitePaper-Shortcomings-CongestionRevenueRightAuctionDesign.pdf

million in 2015 and $737 million in 2016.[12] Over the last seven years the percent of day-ahead congestion rent received by MISO transmission ratepayers ranged between 64% and 89%. This data indicates that transmission ratepayers in MISO have consistently suffered large losses from the FTR auctions.

NYISO. We could not find comparable data for the New York ISO (NYISO). However, in 2014 the *New York Times* reported on large FTR auction profits in the New York ISO.[13] One financial trading company alone made over $180 million dollars over the multi-year analysis performed by the paper. The paper opined that for this company the FTRs "…seemed like a sure thing."

[12] MISO day-ahead congestion rent was about $751 million in 2015 and $737 million in 2016, from p. 50 Potomac Economics *2016 State of the Market Report for the MISO Electricity Market*: https://www.misoenergy.org/Library/Repository/Report/IMM/2016%20State%20of%20the%20Market%20Report.pdf

[13] "Traders Profit as Power Grid is Overworked" *The New York Times* August 14, 2014: https://www.nytimes.com/2014/08/15/business/energy-environment/traders-profit-as-power-grid-is-overworked.html

VI. Additional California ISO CRR charts

Figure 7. Annual non-LSE auctioned CRR portfolio gains and losses (2012-2016)

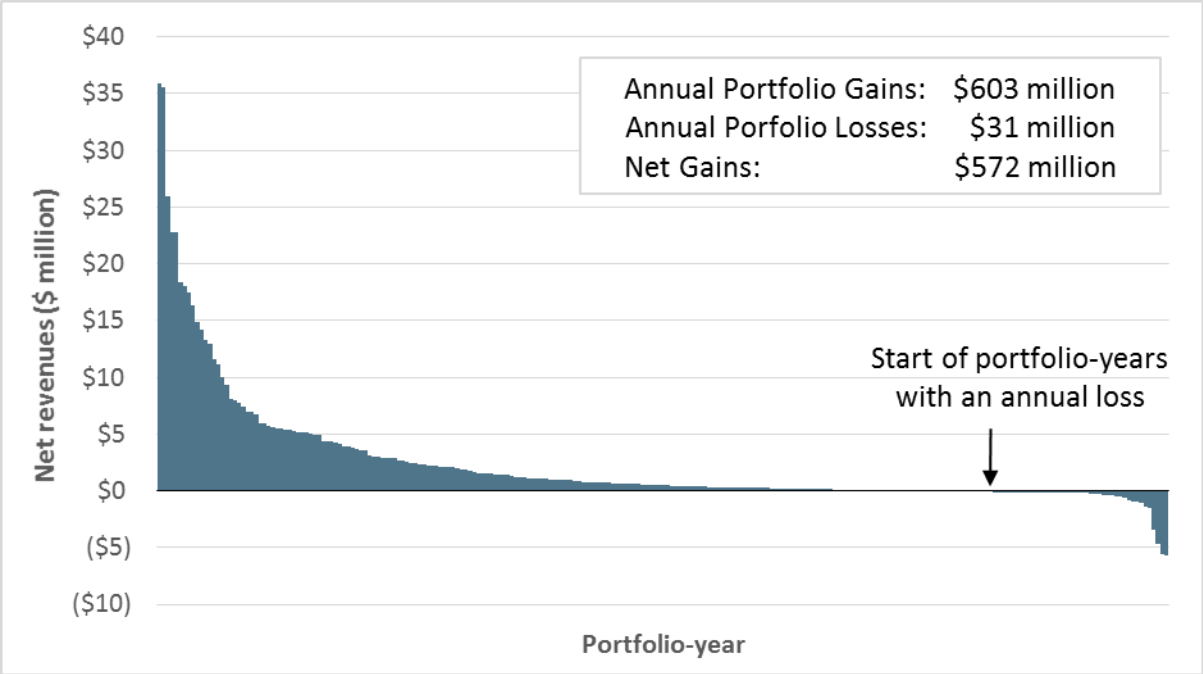


Figure 8. Quarterly non-LSE auctioned CRR portfolio gains and losses (2014 to Q2 2017)

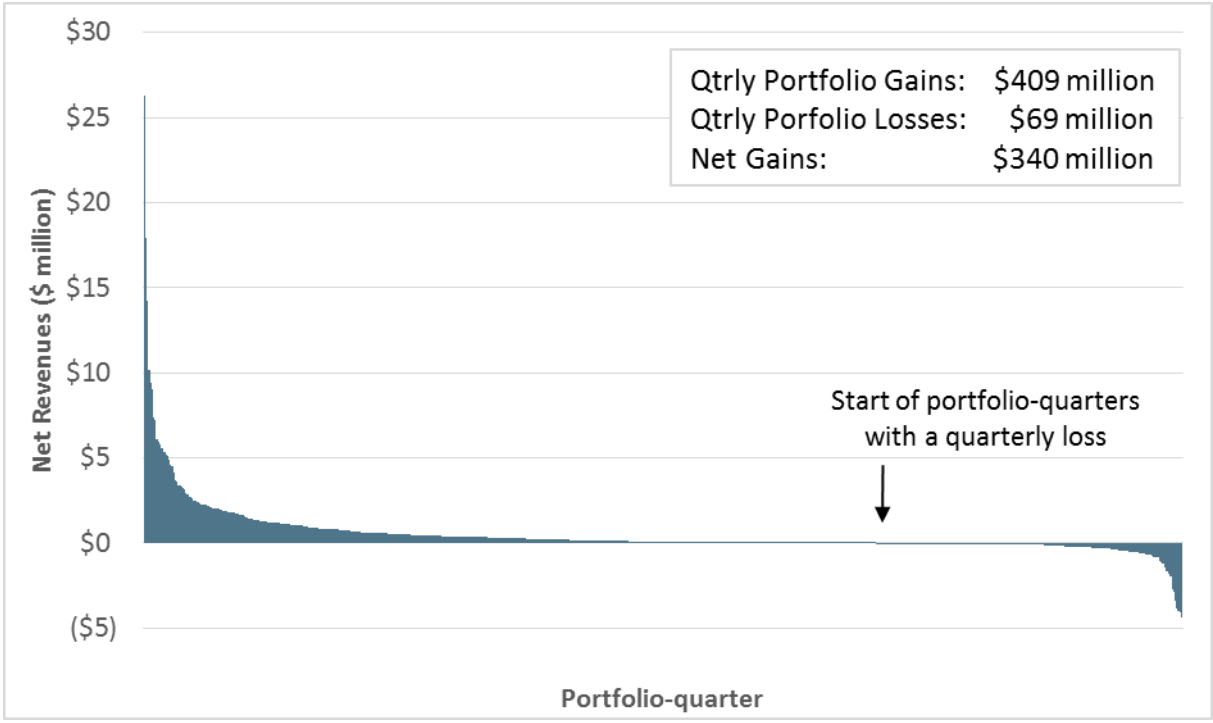


Figure 9. Marketers quarterly auction revenues versus CRR payments by portfolio, 2014 to Q2 2017 (axes truncated at $10 million)

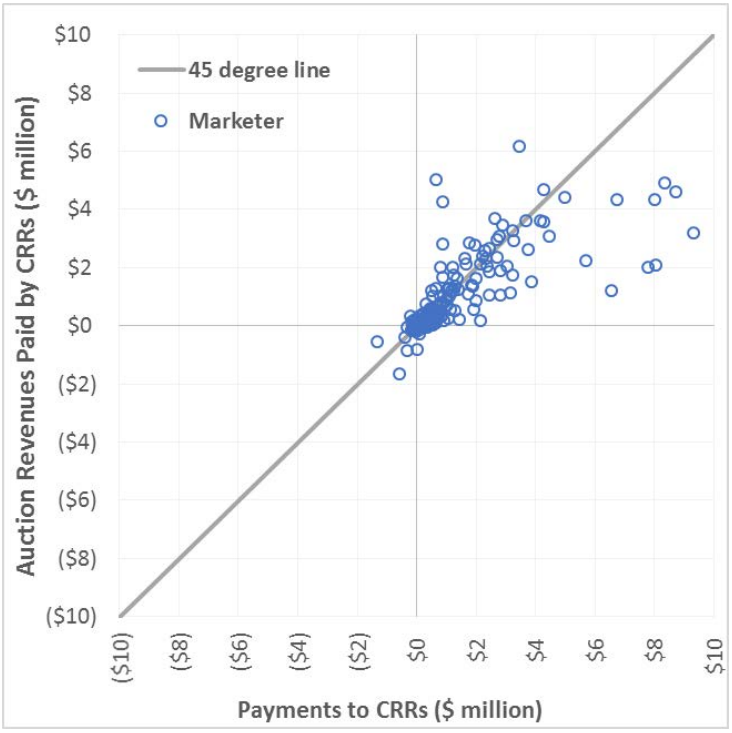


Figure 10. Generation quarterly auction revenues versus CRR payments by portfolio, 2014-Q2 2017 (axes truncated at $10 million)

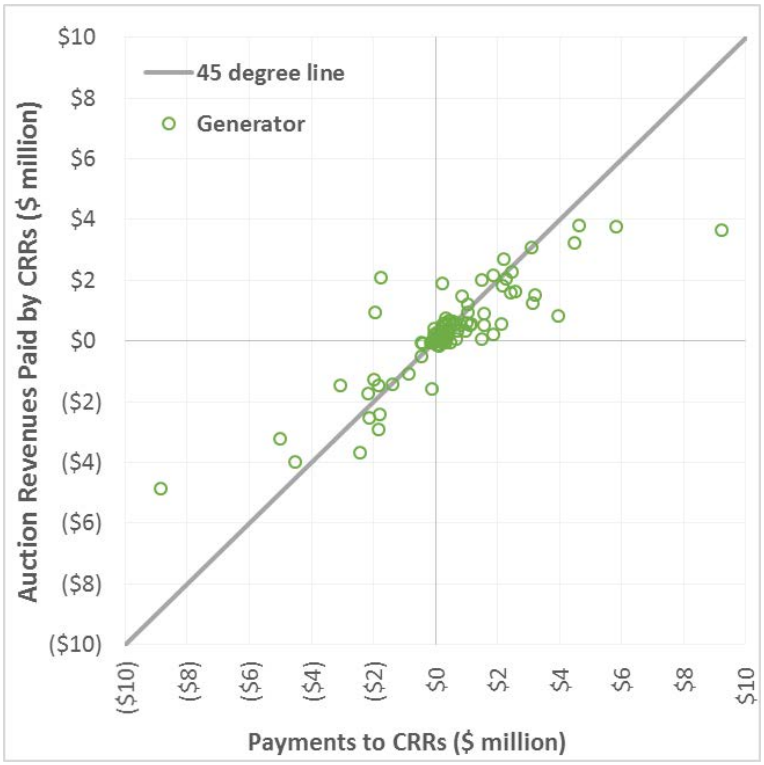


Figure 11. Net transmission ratepayer quarterly CRR positions (2014 to Q2 2017)